

# **Public Comment on 2016 Montana Drought Management Plan (MDMP) DRAFT Update Outline**

Held: November 1, 2016 – December 1, 2016

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Top 10 Points from the Public Comments Submitted:

1. Public Lands: Plan needs to address management of public lands at headwaters.
2. Groundwater: Plan needs to address the management of groundwater, particularly in closed basins.
3. Water Rights: Plan needs to correlate with the Statewide Adjudication of Water Rights and account for the role water commissioners play in managing adjudicated rights and claims to water (ie. address need for consistency and formal performance standards). Consider streamlining permitting processes in emergency situations.
4. Climate Change: Plan needs to address Montana's particular vulnerability to climate change somehow.
5. Funding: Plan needs to address capacity funding for local watershed groups and communities engaging in local drought management.
6. Cloud Seeding: Plan needs to consider weather modification during winter months.
7. Livestock: Partner with state and federal land managers to monitor range conditions on grazing allotments and create use restrictions or voluntary BMPs based on range use when persistent drought conditions exist or are predicted. Create CRP grazing concessions in drought years. Identify where on state and federally managed lands livestock water development can be implemented to distribute grazing impacts across the grazing unit. Explore the potential for awarding credits to older ranchers with exemplary management practices who are leasing to younger ranchers.
8. Agriculture: Create a suite of crop selection choices that can be planted in drought predicted years/areas that are less water sensitive and will have a higher chance of crop return if drought persists.
9. Municipal: Develop yard and garden water use restrictions or BMPs for drought predicted years/areas and implement them in partnership with industrial, educational, private, and municipal partners. Develop green infrastructure sites in municipal lands that can be used to store storm water excess run-off. Provide financial incentives, e.g. rebates, etc. to CII water users to encourage investment in solutions that reduce water use without negatively impacting the quality of discharged water.
10. MSMP Planning Process: Plan is too ambitious to complete in the time available before the next growing season.

**1. Mike Sweet, Montana Climate Office**

"Overall, I find the Drought Management Plan outline to be an (overly?) ambitious effort. As I went through the outline I found myself asking what is the purpose of this section (e.g. What is the question?), how does the section address that purpose or question, and how will we know it is successful. I also found I needed more clarification on scope. What items are the responsibility of State government and what are the responsibility of land owners or those entities that represent landowners (e.g. watershed groups or conservation districts)? What is the role of State government in a Drought Management Plan? When is State government a facilitator, an enabler, and/or a regulator?

Clarify the appropriate scale for the activity. What bullet points are more appropriately carried out by watershed groups or conservation districts at the watershed scale versus the basin scale by DNRC or basin councils where they exist?

I would like to see a section on an “adaptive management” approach to the information base that supporting the plan. Per adaptive management philosophy “a structured, iterative process of robust decision making in the face of uncertainty, with an aim to reducing uncertainty over time via system monitoring” to ensure the efficacy of information and a communication structure to support it. It should be an active rather than passive process.

Section 2 (and where other state or local entities have authority). Identify and clarify existing authority in statute, and any restrictions in statute to that authority.

Section 5a. Focus on characterizing historic climatic drought rather than historic impacts. The social context for drought has changed and the social context (e.g. economic profile) for past droughts no longer applies and not meaningful. If examples are necessary, look for impact examples from the last 20-30 years (within current memory).

Section 5c-i. The Montana Climate Assessment selected climate divisions as climate operates in this context. Thus, if climate diversity was the driving concern then climate divisions would be the appropriate division. If hydrologic drought is of primary concern, then hydrologic divisions would be more appropriate. Just have to be transparent about the difference and why any given division of the landscape might be the most appropriate for this plan. I favor hydrologic divisions recognizing that climate divisions will split some basins and should be reported separately.

Section 5c-ii. The Montana Climate Assessment does address drought somewhat. The general conclusion is that the duration and occurrence of drought in Montana will not change, but the intensity (magnitude) will. Not sure how to quantify that other than to suggest that vulnerability should be assessed in terms of change in intensity.

Section 5d. No entity is identified with taking the lead on the information base that is supporting the decision framework for the entities listed in the section. I assume it would be beneficial that there is some agreement on information resources for Montana to ensure commonality in interpretation and improve communication. The Montana Climate Office is interested in being actively engaged with others in determining the appropriate representation of climatic factors for drought.

Section 6b-i (1). I suggest that local information be compiled prior to this meeting, including the local entity’s interpretation of the status of their drought plan and its appropriateness to the water year. March should also include a consensus on the information base that will be utilized for the March to October period for that water year.

Section 6b-ii. October meeting needs to include a post-mortem on information resources and an evaluation of strengths and weaknesses during the water year with recommendations for the next water year.

Section 6d. We use MCO as the abbreviated form for Montana Climate Office

Section 7c. This needs to be done in cooperation with watershed groups. It would help communication if a consistent approach was developed, that also allowed for aggregation of watersheds (ultimately to basin-level)

Section 8d. This is one section where it is important to ask “what is the question” or “why do we need this”. What do we hope to gain by doing this and how does it fit into the overall goal of drought planning.

Section 8d-i. I would like to see monitoring address irrigated and non-irrigated economies “ perhaps separately.

Section 8d-iii. I see this section as a great opportunity for a small grants or matching grants program to advance these issues

Section 9e. I see a great opportunity to coordinate this section with or through basin councils (and their respective watershed groups and conservation districts). Advances the State Water Plan. Could be a great collaborative activity, but would need funding for facilitation."

## **2. Bob Simms, Private Citizen**

"I see nothing in your plan that addresses the basic impact of the DNRC giving away 3,300,000 gallons of water every year for each "exempt" well drilled even in CLOSED basins. While the DNRC has finally come to accept that ground water and surface water is the same water this is not reflected in their actions. EVERY EXEMPT WELL MAKES THE IMPACT OF THE NEXT DROUGHT WORSE!!!!"

## **3. Jim Hagenbarth, Private Citizen**

In general the SDMP is well thought out in regard to dealing with the impacts of drought. The one big hole I see is that little is said about the enhancement of precipitation that flows from our watersheds, especially in the western part of the state east of the Continental Divide. There are two main issues that need to be addressed. Most of our watersheds are on federal lands where past fire management, timber management, vegetative management and lack of a working landscape philosophy has resulted in a significant loss of water yield and potential yield. Much of this is a result of litigious extremist and a general public that has little sense of resource management except for access and free recreational opportunities. The use of the ESA, CWA and NEPA as weapons have had a huge impact on the water yield from our federally owned watersheds. The increase of timber and brush slopes in the last 100 years is well documented. This fact along with a dryer weather cycles is making a more pronounced impact on water availability. Water will become our most valuable resource and this yield loss will have huge economic and sustainable resource implications. Water yield should become a priority as we comment and consider every management action on these federal lands. We need to get the precipitation from the sky into the ground water resource so we have a better opportunity to manage. To let it just evapo-transpire away (50%) on a full canopy cover forest is unacceptable. We must focus on the yield of our watersheds and get the only source of water we have on the ground and stop this short circuiting of the water cycle that is man caused. The other water enhancement tool we should consider is weather modification during the winter months (cloud seeding). This is being practiced by the surrounding states and could make a 6 to 15 percent difference in snow pack and water yield from our upper watersheds. The science of weather modification has come a long way and the ability to determine where and when cloud seeding is appropriate and positive is becoming a reality that should be considered. (Google: (Idaho Power Cloud Seeding) for more info). The two suggestions above are long term options that would increase water yields and certainly need to be addressed. The sooner the better. I did not see these two issues covered in the SDMP and they should be.

## **4. Bruce Suenram, Deputy Chief Fire and Aviation Management**

Change DES County Executive Director to "DES Coordinator/Emergency Management" or something similar.

## **5. Sierra Harris, The Nature Conservancy**

4b. Need: Inter-agency Coordination - does this include user groups like Irrigation Association and Conservation Districts?

5b. Guiding Philosophy - Does this include user groups like watershed groups and Conservation Districts?

5dii. Need: Where will this resource be available for reference by local drought managers?

6ai. Might want to allow for 1 or 2 non-state related people to vote as well - better stakeholder representation.

6di. Need: Perhaps a role for MT Watershed Coordination Council?

7a. Purpose: Perhaps address MT's vulnerability to Climate Change here or somewhere else?

13. Need: Communication & Coordination - need to address need for capacity funding for local watershed groups to ensure they can help with communication and coordination work in their local communities.

#### **6. Peter Brown, Gallatin Valley Land Trust, Stewardship Director**

The following comments are submitted by Gallatin Valley Land Trust. Each comment is coded to the subsection of the outline by number.

5.d.iii.2 and 5: Dept of Livestock; monitor range condition on state and federal grazing allotments and create use restrictions based on range use when persistent drought conditions exist or are predicted for that state region, this data can be collected to create a longterm range condition profile that can help with future grazing allotment use

5.d.iii.4: Dept of Agriculture: develop a suite of crop selection choices that can be planted in drought prediction years that are less water sensitive and that will have a higher chance of crop return if drought persists. Distribute the list of CD's, Extension, crop production contractors etc.

5.d.iii.6: DEQ-Municipal Water Users: Develop yard and garden water use restrictions that are mandatory when drought conditions persist, implement in partnership with industrial, educational, private, and municipal park land partners. Develop green infrastructure sites in municipal lands that can be used to store storm water excess run-off.

10.e: create CRP grazing concessions in drought years so that restricted lands can be brought into the grazing pool in drought years. Coordinate federal and state grazing allotment range condition monitoring in drought predicted years so that response can be coordinated and impacts lessened when range utilization standards have been met. Open under utilized grazing leases in drought years to distribute grazing impact across the landscape.

11.b: After Drought Assessments: Assess range conditions on state and federal grazing leases in drought years and decrease use allocation if range utilization dictates less use in future years to allow for range condition recovery

12.c: Identify location on state and federal grazing allotments where livestock water development can be implemented to distribute grazing impact across the entire grazing unit, this could include cost

sharing new wells and upgrading livestock water facilities to decrease waste and train excess water back into drainages or into location that can be augmented to provide natural landscape storage of excess water.

**7. Nancy Levenson, Ecolab, Vice President, Government Relations**

Ecolab is pleased to submit the following comments on the “Outline for the State Drought Management Plan.”

By way of background, Ecolab is headquartered in St. Paul, MN, employs 47,000 associates and is a global leader in water, hygiene and energy services. Ecolab serves a wide range of commercial, institutional and industrial (CII) sector customers, including healthcare, food service and hospitality, food and beverage processing as well as provides industrial water services.

Our Nalco Water division is the world’s leading water treatment and management company. Through Nalco Water, we provide solutions and control systems for cooling, boiler and wastewater applications in refinery, petrochemicals, steel, power, commercial buildings and other industries through our patented technologies such as 3D TRASARTM, which was awarded the U.S. Environmental Protection Agency’s Presidential Green Chemistry Award.

As businesses across the globe set and achieve ambitious water and energy conservation goals, Ecolab helps our customers meet their sustainability goals at more than 1.3 million locations around the world. In 2015, we helped customers across more than 40 industries conserve more than 142 billion gallons of water, reducing their environmental impact and risk while improving the livelihoods of the communities in which they operate.

For example, an oil company had a facility with two cooling towers that were operating at an average of 1.3 cycles of concentration, resulting in a high rate of blowdown to the wastewater system. Ecolab worked with the customer to identify a solution to reduce wastewater flow and improve corrosion inhibition. The facility installed Ecolab’s 3D TRASAR Technology for Cooling Water for automated control of the chemical treatment and was able to achieve its goals of improved sustainability through water savings, improved reliability through reduction in corrosion, lowered operating costs and improved ability to handle potential upsets in the waste treatment area. Overall, the project enabled the facility to reduce water use by more than 800 million gallons per year.

While Ecolab is a global company with a very broad reach, our business in Montana is critical to our operations. Indeed, many of our most important customers operate in the state, including Benefis, Billings Clinic, BNSF Railway, Dean Foods, ExxonMobil, Montana State University, Phillips 66, Talen Energy and Town Pump. Our Montana customers depend on our water treatment and efficiency products and services to help them make their operations cleaner, safer, healthier and more efficient. We are most encouraged by and strongly support your heightened focus on water conservation by enhancing your Drought Management Plan. Given the ongoing drought in California and water-stressed conditions prevailing in much of the West, including Montana, we think it is a prudent move on the state’s part to put a plan in place to minimize the impact of drought in Montana, thereby supporting the continued success of your economy and society while meeting the needs of Montanans well into the future.

With this in mind, we would like to respectfully offer a few suggestions for your consideration as you

draft and finalize this plan.

The “Vulnerability Assessment”<sup>2</sup> section of the draft highlights five vulnerability sectors susceptible to drought in the state. We suggest adding “Commercial & Institutional” as a sixth sector since these businesses use significant amounts of water and are at risk when facing a prolonged drought. In the same vein, we believe the “Emergency Declaration and Response” section for determining the sectors for which to evaluate impacts should mirror the sectors listed in the “Vulnerability Assessment.” To that end, we would suggest pairing “Recreation & Tourism,” adding Industrial to “Power & Mining” and creating a sixth sector for “Commercial & Institutional.”<sup>3</sup>

The Vulnerability Assessment section calls for a qualitative and quantitative assessment tool to assess risk. We agree with stated need of a qualitative and quantitative risk-assessment tool to evaluate overall statewide risk, but Montana should also promote facility-level risk assessment tools to water users to increase awareness of water risk and spur improved water management. Ecolab has worked with Trucost, the global leader in valuing natural capital, to develop the Water-Risk Monetizer (WRM). The WRM is a publicly-available tool designed to assess water risks at a facility level, providing a risk-adjusted cost of water and the revenue risks resulting from water scarcity and insecurity. More information about the WRM is available at [www.WaterRiskMonetizer.com](http://www.WaterRiskMonetizer.com).

Monitoring water use is an important step to protecting water resources. While the current draft outline, especially in Section 9, does a good job highlighting the need importance of monitoring water supply, there remains opportunity to encourage water users in the state to monitor their own water use as the lack of facility-level monitoring can lead to undetected inefficiencies. Solutions like Nalco Water’s 3D TRASAR Technology, which uses real-time monitoring and 24/7 information management capabilities to detect, determine and deliver improved performance and efficient operations in industrial applications. The State Drought Management Plan should call for water users in the state to use data and information management to drive efficient water use.

Section 12 calls for funding a drought response fund. We think this is appropriate, and that making state funds available for pre-drought planning efforts and long-term mitigation projects will go a long way toward preventing or mitigating the effects of drought. We hope this fund will be prioritized given the state’s lengthy drought and forecast for ongoing water shortages.

Ecolab has extensive experience helping CII businesses improve the efficiency of their operations while reducing water use. Nationally, these businesses represent 20 percent of human water use is roughly twice the impact of private or residential water use. Ensuring that CII businesses are recognized as an important steward of fresh water resources is important, and providing financial incentives for these businesses to further improve their operations is an easy way to improve the livelihoods of communities across the state. With this in mind, we suggest the following addition to the “Funding” section of the draft:

“Provide financial incentives, e.g. rebates, etc. to CII water users to encourage investment in solutions that reduce water use without negatively impacting the quality of discharged water.”

In closing, we are encouraged to see Montana addressing this important issue, and we look forward to finding ways to work with you to develop a final plan as you consider these and other suggestions.

## **8. Meg Casey, Trout Unlimited, Montana Water & Habitat Program**

Trout Unlimited's Montana Water and Habitat Program (TU) appreciates the opportunity to review and comment on the Draft Outline of the State Drought Management Plan. TU strongly supports the DNRC's effort to revise the existing drought response framework to meet state and federal mandates, and ensure funding tools are more accessible to local planning, monitoring, and mitigation efforts.

The Draft Outline identifies a laudable scope of building blocks necessary to facilitate long-term water management that can be tailored to support location-specific needs. This is particularly evident in Item 6. Structure & Function, that states there be a clear and working mode of communication between the Drought and Water Supply Advisory Committee and local stakeholders. We strongly encourage that this framework of the State and basin plans are adaptive and flexible in nature as to accommodate project opportunities as they arise.

**9. Vicki Baker, Teton Conservation District**

It would be nice to have the discussion about credits to older ranchers leasing to younger ranchers.

**10. Kevin Smith, DNRC, State Water Projects Bureau Chief**

The one thing that I did not see in the plan was final adjudication / basin enforcement / and establishing consistency and formal performance standards with water commissioners. Seems that before much drought planning occurs, it's proper to have an established metric. (yeah, I know – damn engineers)

**11. Michael Lawler, Private Citizen**

This matter is likely less important in Helena, Missoula or Billings because the bench is deep enough that when someone moves on other citizens step up. However, in the short time I have been here, active in local civic groups, and served on the State Water Plan watershed group, I have been informed by others and especially those from smaller towns that identifying folks to volunteer to serve on civic groups is a serious issue. So, if you do not plan for succession two things occur it seems. First, the oral history of the efforts does not get passed on leading to a tendency to re-invent the wheel. Second, when someone leaves town or goes off of a civic group a very big gap can occur before someone steps forward or is identified to fill that vacancy. This is not unique to Montana because voluntary associations (if one is to believe the literature on them) across the county have this succession issue. I do think it is or can be more serious in a region which is largely rural with smaller towns simply because the pool of possible volunteers is much smaller than in a town of thirty to one hundred thousand. If, as I think is most desirable, state wide efforts on drought or public access to lands or anything else are going to rest on local and volunteer citizen groups for policy formulation, data gathering, and program evaluation—— succession planning from the start is crucial for long term success.

**12. Kerri Strasheim, DNRC Regional Office Manager, Bozeman**

In looking at the outline – very interesting!

- The beginning sets a very clear tone for the State – provide resources, funding, clearinghouses of information, and encourage a bottom-up approach.

- So then 7 – County scale cataloging by State? I think clarification on how this is at the state level (for state assets, etc.) could be helpful – defining the scope further. I took a look at Colorado's – that looks like a lot of work. You might see if UofM and MSU can create a Drought 400 level class to address these for you ☐ Of course, the process timeline looks pretty tight for this...maybe a questionnaire sent out to key state employees statewide, kind of like the City of Bozeman did.



- Under 7.b. – this is a big one. The resources needed for something the exact same (field mapping everything on foot) are tremendous – you might consider allowing for an alternate resource of a similar nature...
- Under 7.e.iii. – this is one that could result in negative reactions, as “most valuable sector” is not defined, and values differ. I would consider rewording to identified locally-valuable sectors, or something that communicates input, versus a top-down value judgment?
- 8.d.iii. – these should all be kept high-level. In 3. The State DWSAC/MSAC isn’t going to be able to “resolve emerging water use conflicts”. The State could provide resources and work with appropriate parties for more efficient water use conflict resolution? Or some other type of high-level language, such as outreach and education on how drought planning leads to less water use conflict and can provide guidance for conflict resolution?
- 8.d.iii.6. – this one probably needs clarified – I am not sure what is meant here?
- 11.a.v.1 – District Court currently manages Water Commissioners, not Water Court (there is politics going on regarding this very issue). Water Court/DNRC provides the water right info. You might consider seeing if drought planning could be reflected in water rights enforcement projects in the database...(DNRC John Peterson could provide insight here, such as whether trigger flows could be called out in the indexes.)

### **13. Eric Trum, DEQ, Water Quality Specialist**

Regarding current response – DEQ is in the process of bringing on a temp/intern to map past 319 projects (and maybe others). This seems like a logical overlap but unknown what additional resources would be needed from a management perspective.

Regarding putting together a more organized, locally-informed and targeted approach to drought response – Consider aligning with the monitoring website that MWCC is putting together. For more info on that you may want to touch base with Katie Makarowski here at DEQ, Katie Steele, and/or Adam Sigler at MSU EWQ

Regarding inter-agency coordination as it pertains to DEQ - Thoughts on what this looks like? I'll attach a 1995 MOU for basically this end, which identifies MWCC as the forum for coordination.

Regarding Defining drought in Montana - What qualifies as drought? This will likely be covered in history but it seems like this is essentially planning for a/the future that will be inherently drier and have less precipitation and an altered hydrograph.

Regarding the Future of drought - This may send this too far off into the weeds and may largely be covered in section 5c (below). But I think while the history of drought is important its use is for predicting and planning for the future. This may be an opportunity here to say here are the expected recurrence and impacts of drought in the future - mirroring what is articulated in section 5.a.i

Regarding outlining what each state agency currently does and what it would like to do going forward is a great idea - DEQ would most directly relate to temperature and low flow impairments

Regarding the first meeting - Why March? This seems early to make predictions - though I'm likely off. Seems like there could be significant changes to snowpack and runoff timing after March

**14. Scott Buecker, Advanced Engineering and Environmental Services, Inc. (AE2S), Senior Project Manager<sup>1</sup>**

Monitoring data – Any future, local DMPs will need to have vulnerability, monitoring and response triggers based on the sources of water supply for the local entity. We spent a lot of time and effort working with DNRC, MBMG, NRCS to get at data that is reported online, but not in a usable format online. These DWSAC meetings might be a good opportunity to explain that issue. The agencies all were cooperative in sharing their actual databases in the end, once they understood our intent and need.

Under section 5.b.iii., I would consider putting some thought into streamlining permitting processes in an emergency response situation. In California there were emergency response projects (infiltration gallery rebuilds at lower elevations in rivers, pipelines installed to access new sources of water, pump stations on floating barges to pump water from reservoirs to outfalls that had become higher than the water surface elevation, etc) that, in some cases, were slowed by permitting issues that needed to be expedited. In the end, they were expedited, but sometimes needed high level political action to get expedited. Might be good to brace people and agencies for that potential.

Vulnerability Assessment – In an effort to identify communities or water systems that are most vulnerable to a drought, maybe the Water Resource Survey can request that agencies or communities providing public water supplies provide their source(s) of water, their total water rights, and the average and peak day demand for their system for the last three (or even five) years. Then look for systems that do not have significant supplies or water rights on a large reservoir, river (relative to the community's size and water use) or groundwater aquifer. While I agreed with the gentleman who spoke about the most vulnerable people being those who are NOT on community systems, the consequences of a water shortage for an individual or a very small development are very small relative to a system that may serve hundreds or thousands of connections.

On a related note, I think your risk equation may be modified to Risk = Hazard x Vulnerability x Consequence (criticality). This is similar to risk assessment work approaches on water supply and distribution systems, for ranking of priorities.

**15. Wyatt F. Cross, MSU, Associate Professor of Ecology, Director, Montana Water Center**

You might consider including 'Universities' in some of the drought plan statements (e.g., 4b on page 1), that discuss coordination and collaboration among agencies and others. I am certain that some of our faculty would be very interested in working with you and other agencies in the state to make sure the science is translated appropriately.

**16. Nancy Schultz, Private Citizen**

Drought has been an established condition for four of the past five years in Montana and needs to be addressed, and it is my hope that my comments will have meaningful input for the State Drought Management Plan.

According to NOAA, drought is a pattern in Montana. Here are the conditions in mid-August for the last five years. August 14, 2012 80% of Montana is abnormally dry or in moderate or severe drought. August

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<sup>1</sup> AE2S performed much of the work involved in the City of Bozeman Drought Management Plan.

13, 2013 50% of Montana is abnormally dry, or in moderate or severe drought and SW Montana is in extreme drought. August 19, 2014 20% of Montana is abnormally dry. August 8, 2015 70% of Montana is abnormally dry or in moderate or severe drought with 10% in extreme drought. August 23, 2016 60% of Montana is abnormally dry or in moderate or extreme drought.

The focus of these comments will be the impact of drought and climate change on Montana rivers and streams, with a focus on important fisheries.

Here is what happened on the Yellowstone River, the most important fishery in the state, in the summer of 2016. This past August, FWP confirmed the deaths of at least 4,000 whitefish due to the parasite in the Yellowstone River and a few trout were also found dead, but they estimate the total death toll for whitefish to be in the tens of thousands. Warm water and low flows are contributors to the die off. Officials shut down recreation on a wide swath of the river, and nearly 200 river miles of rivers were closed to all recreational use in order to prevent the pathogen from spreading. That came with a tremendous cost to the economy. The importance of the outdoor recreation economy is well documented by Thomas Michael Power, PhD in his report [The Impact of Climate Change on Montana's Outdoor Economy](#). Montana cannot afford to lose or diminish our outdoor economy.

Montana Democratic U.S. Sen. Jon Tester sent a letter to the U.S. Army Corps of Engineers asking them to consider starting studies or projects that would enhance natural riverine processes, protect riparian areas, restore instream flows, and achieve other ecosystem restoration benefits that help mitigate the warmer and drier weather patterns that affect the Yellowstone and the Missouri and the Clark Fork drainages and the tributaries should be considered as well. The Corp should be involved in the drought plan. Mitigation measures should be implemented. It is not enough to study and report the impacts of drought and climate change.

In Montana now, 97% of surface water is used by irrigators. In times of drought, irrigators must share this public resource. Climate change will change river stream flows; the snowpack (that rivers and streams depend on will melt off earlier, which means less water available when it is needed for irrigation recreation and aquatic life. We must share. This sharing, minimum stream flow, must be mandated, it cannot be voluntary. An attachment from MSU Extension shows how water intensive the major crop in Southwest Montana, alfalfa, is; and given that the major alfalfa producing county – Beaverhead has an annual precipitation of 10 inches a year, it is not difficult to understand that a great deal of surface water is diverted for irrigation. A drought plan must address diversions for irrigation.

The drought plan should also address ways to naturally promote absorption of snowmelt into the groundwater system, Natural absorption can be accentuated with healthy riparian areas; trees to shade the snow cover release the snowmelt more slowly, tall grasses that cool the streams and rivers for aquatic life, establishing beaver on streams and tributaries to pool the flow which releases it more slowly.

Key tributaries that are important fisheries or connect to important fisheries must have adequate water available. Important fisheries have been identified by Montana Fish Wildlife and Parks. Too many tributaries are dewatered, especially in drought. An example is Mill Creek in the Paradise Valley. In the

summer of 2016 there was NO flow in the creek. The problem was not a lack at the source; the problem was a complete diversion (just outside the National Forest Boundary). When the irrigation withdrawals ended, Mill Creek flowed again. Important fishery tributaries must have regulations to maintain a minimum flow.

The drought plan should address letting rivers access their natural floodplains rather than building too many structures to keep a stream inside its channel, Channeling inhibits riparian areas from forming. Especially in drought it is necessary to stop controlling the centerline flow for important fisheries so that the river can reach its equilibrium naturally which will foster the establishment of riparian areas.

Building natural resilience into the systems with minimum stream flow, and healthy riparian areas are probably the most effective ways to buffer drought and the impacts of climate change and this will help fish wildlife habitat and recreation.

Attachment – MSU Extension “Making A Ton of Hay!” by James W. Bauder

**17. Joe Gutkoski, President Montana River Action**

Drought has been established condition for four of the past five years in Montana and needs to be addressed, and it is my hope that my comments will have meaningful input for the State Drought Management Plan.

According to NOAA, drought is a pattern in Montana. Here are the conditions in mid-August for the last five years. August 14, 2012 80% of Montana is abnormally dry or in moderate or severe drought. August 13, 2013 50% of Montana is abnormally dry, or in moderate or severe drought and SW Montana is in extreme drought. August 19, 2014 20% of Montana is abnormally dry. August 8, 2015 70% of Montana is abnormally dry or in moderate or severe drought with 10% in extreme drought. August 23, 2016 60% of Montana is abnormally dry or in moderate or extreme drought.

The focus of these comments will be the impact of drought and climate change on Montana rivers and streams, with a focus on important fisheries.

With Montana being heavily impacted by drought and with climate change showing warmer and drier patterns, a plan must be made to recognize the importance of building resiliency into river systems. Montana must make river systems more able to deal with drought and the effects of climate change. One overarching change should be establishing a minimum stream flow. The stream flow should be at least 25% of the average annual flow. This minimum flow should stay in the streams and rivers.

In Montana now, 97% of surface water is used by irrigators. In times of drought, irrigators must share this public resource. Climate change will change river and stream flows; the snowpack (that rivers and streams depend on will melt of earlier, which means less water available when it is needed for irrigation, recreation and aquatic life. We must share. This sharing, minimum stream flow, must be mandated, it cannot be voluntary.

The drought plan should also address ways to naturally promote absorption of snowmelt into the groundwater system, Natural absorption can be accentuated with healthy riparian areas; trees to shade

the snow cover release the snowmelt more slowly, tall grasses that cool the streams and rivers for aquatic life, establishing beaver on streams and tributaries to pool the flow which releases it more slowly.

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Building natural resilience into the systems with minimum stream flow, and healthy riparian areas are probably the most effective ways to buffer drought and the impacts of climate change and this will help fish wildlife habitat and recreation.